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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,493	11/14/2003	Gary Edward Trewiler	134314	9211
23465 7590 07/26/2007 JOHN S. BEULICK C/O ARMSTRONG TEASDALE, LLP ONE METROPOLITAN SQUARE SUITE 2600 ST LOUIS, MO 63102-2740			EXAMINER AFZALI, SARANG	
			ART UNIT 3726	PAPER NUMBER
			MAIL DATE 07/26/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/713,493

Applicant(s)

TREWILER ET AL.

Examiner

Sarang Afzali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species requirement of claim 5 (titanium alloy) and Species requirement of claim 6 (compressor rotor blade) in the reply filed on 4/26/2007 is acknowledged. However, the restriction requirement is withdrawn due to the fact that the phrase "at least one of a" used in claims 5 and 6 to define materials and components, are in alternative forms and even though these species have mutually exclusive characteristics, nevertheless, only one of each group of species is required at a given time to be considered.

Claim Objections

2. Claim 2 is objected to because of the following informalities:

Line 3, should read -- the remaining blade portion. --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for repairing a damaged rotor blade using different embodiments, does not reasonably provide enablement for a combination of these

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embodiments. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The limitation "machining the weld such that the newly formed rotor blade has a contour that mirrors that of the original blade contour" is unclear as how machining a single joint weld along the cut line would make the contour of the newly formed rotor mirror to the contour of the original blade contour? At best, this machining would only provide a smooth weld joint and nothing more.

In the Specification (paragraph [0021]), several different embodiments are disclosed including one that the replacement portion has a predetermined contour equivalent to the contour of the damaged portion that would result in the formed portion to have an equivalent contour as its original contour (lines 9-13).

In another embodiment (lines 13-18), a repaired blade has an improved aerodynamic performance compared to the original blade.

In yet another exemplary embodiment, the welding material is "machined to obtain a desired finished dimension" and that the machining "includes rough-blending, and final blending the **welded replacement**" (not the weld alone), "such that the repaired blade has a contour that mirrors the contour of the damaged blade" (lines 20-25).

Therefore, it is not clear if these different embodiments are mutually exclusive of each other or not? It is not clear how an improved aerodynamic shape of the repaired blade (as recited in claim 1), could meet the limitation of repaired/formed blade having a

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contour that mirrors the original blade contour? The repaired blade contour is either different or similar to the original blade contour.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, recites the limitation that the coupling of a replacement portion to the remaining portion is done by a single-pass weld and nothing else. However, claim 2, which depends on claim 1, further recites a more general limitation that the coupling of a replacement blade portion further "comprises welding the replacement blade portion to the remaining blade." It is not clear exactly what subject matter is the Applicant claiming in claim 2 that is not already defined in claim 1.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2-4 as best understood, and 5-6 are rejected under 35 U.S.C. 102(b) as anticipated by Meier et al. (US 6,438,838) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Meier et al. in view of Wachtell et al. (US 3,650,635).

As applied to claims 1, 2 and 6, Meier et al. teach a method of replacing a portion of a gas turbine engine rotor blade, the hollow (claim 18) rotor blade having an original blade contour defined by a blade first sidewall and a blade second sidewall, said method comprising:

cutting through the rotor blade such that a cut line extends from a leading edge of the blade to a trailing edge of the blade and between the first sidewall and the second sidewall, and such that the cut line extends at least partially through a hollow portion of the blade defined between the first and second sidewalls;

removing the portion of the rotor blade that is radially outward of the cut line; and

coupling a replacement blade portion to remaining blade portion (with a single-pass weld forming a single weld joint extending along the cut line such that a newly formed rotor blade is formed with an aerodynamic contour that is one of an improvement in an aerodynamic performance over the original blade contour and mirroring the original blade contour (Abstract, Figs. 1-4).

In the alternative, if the applicant believes that Meier et al. disclosure of "welding the replacement vane section in a protective gas atmosphere by exciting the inductor with high frequency current and moving opposing heated part surfaces together" (Abstract, lines 11-15) does not meet the limitation of "single weld forming a single weld joint" recited in claim 1, Wachtell et al. teach a method of repairing a damaged hollow

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turbine blade by removing a damaged area and inserting a replacement section and welding the parts together with electron beam welding (well known in the art to provide a single pass weld) to provide a single weld joint along the cut line such that the newly formed rotor blade has even better and more improved characteristics than the original blade (Figs. 1, 3 & 4, col. 1, lines 53-58, col. 3, lines 50-53).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided Meier et al. with a single pass weld as taught by Wachtell et al. in order to provide a weld joint resulting in a better and more improved characteristics of the repaired blade than the original blade.

As applied to claim 3, Meier et al. teach that a further machining step is performed subsequent to the welding step (col. 4, lines 13-17).

As applied to claim 4, Meier et al. teach the automatic welding of the replacement portion to the remaining blade portion (Fig. 4, col. 3, lines 53-60).

As applied to claim 5, Meier et al./Wachtell et al. teach the invention cited wherein Wachtell et al. teach that material of replacement and remaining blade portions are the same (col. 1, line 56) and that the compositions of superalloys used for turbine component/blade comprise of nickel-base alloy including titanium (col. 3, lines 4-9) and cobalt-base alloy including iron (Fe, col. 3, lines 10-14).

Response to Arguments

9. Applicant's arguments filed 01/08/2007 and 04/26/2007 have been fully considered but they are not fully persuasive.

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10. Applicant's traverse to the Election of Species requirement mailed on 3/28/2007 is acknowledged and for the reasons stated earlier in this action, the restriction requirement is withdrawn.

11. Applicant's main argument with respect to the rejection of claims 1-7 under 35 USC 102(b) anticipated by Meier et al. filed on 1/08/2007 is noted. Applicant argues that Meier et al. does not describe or suggest coupling a replacement blade portion to a remaining blade portion with a single-pass weld that forms a single weld joint extending along a cut line extending from a leading edge of the blade to a trailing edge of the blade, and at least partially through a hollow portion of the blade defined between the first and second sidewalls. However, Meier et al. teaches all the claimed steps of cutting and removing a damaged portion and coupling/welding a replacement portion to the remaining portion of the blade. The fact that remaining portion in Meier et al. is a stub is immaterial. Note that Meier et al. teach that cut off line could be at any section of the original blade (Fig. 2, col. 2, lines 38-42) depending on the location of the damaged area.

12. As for the single-pass weld forming single weld joint limitation, the disclosure of "welding the replacement vane section in a protective gas atmosphere by exciting the inductor with high frequency current and moving opposing heated part surfaces together" (Abstract, lines 11-15) by Meier et al. indeed teach the claimed limitation.

Note that the Applicant (Specification, paragraph [0022], lines 11-14) use of a single weld joint is to facilitate less weld defect and accordingly less weld area to be inspected including use of resistance projection weld method that would result in a

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shorter time and less cost for the repair. Similarly, Meier et al. disclose a method of repair wherein a high-frequency current used in welding step would require a shorter time and less force to press the joined portions together (col. 1, lines 64-67, col. 2, lines 1-4) therefore, no subsequent machining would be required (col. 4, lines 14-17).

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarang Afzali whose telephone number is 571-272-8412. The examiner can normally be reached on 7:00-3:30 M-F.

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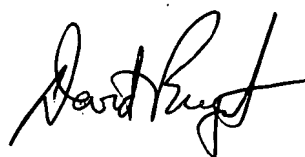
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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7/10/2007



DAVID P. BRYANT
SUPERVISORY PATENT EXAMINER

7/17/07